CLAIMS:

[C001] 1. An ultrasound system comprising:

an ultrasound probe configured for sensing and transmitting analog electrical signals; and

an optical conduit configured for coupling a light source and a optical detector in an optical path; wherein the optical conduit comprises electro-optic modulators configured for modulating optical signals on the optical conduit with at least one of the analog electrical signals configured to generate corresponding optically modulated analog signals on the optical conduit.

[C002] 2. The ultrasound system of claim 1, wherein the electro-optic modulators comprise a polymer material.

[C003] 3. The ultrasound system of claim 2 wherein the electro-optic modulators comprise silicon.

[C004] 4. The ultrasound system of claim 2, wherein the ultrasound probe further comprises an amplifier configured for amplifying the analog electrical signals.

[C005] 5. The ultrasound system of claim 2, wherein the optical conduit further comprises:

a plurality of multiplexers, each configured for coupling a corresponding one of the electro-optic modulators and a corresponding set of the transducer elements and conducting electrical signals of a selected one set of transducer elements to the corresponding one of the electro-optic modulators.

[C006] 6. The ultrasound system of claim 1, wherein the ultrasound system further comprises a plurality of demultiplexers configured for demultiplexing the optically modulated analog signals received from the electro-optic modulators.

[C007] 7. The ultrasound system of claim 1, wherein the ultrasound probe further comprises a plurality of cooling lines configured for maintaining a probe temperature.

[C008] 8. The ultrasound system of claim 1, wherein the light source comprises a laser source.

[C009] 9. The ultrasound system of claim 8, wherein the optical detector configured for converting the optically modulated analog signals to corresponding digital signals.

[C010] 10. A method for generating an image, the method comprising:

sensing a plurality of signals and generating corresponding electrical signals;

modulating the optical signals with the electrical signals to generate a corresponding plurality of optically modulated analog signals;

converting the plurality of optically modulated analog signals to a corresponding plurality of digital signals; and

processing the plurality of digital signals to generate the image.

[C011] 11. The method of claim 10, wherein the plurality of signals comprise ultrasound signals.

[C012] 12. The method of claim 11, wherein sensing further comprises an amplifying the electrical signals.

[C013] 13. An ultrasound system comprising:

an ultrasound probe configured for sensing and transmitting electrical signals; and

an optical conduit configured for coupling a light source and a optical detector in an optical path, wherein the optical conduit comprises electro-optic polymer modulators configured for modulating optical signals on the optical conduit with at least one of the electrical signals configured to generate corresponding optically modulated analog signals on the optical conduit.

[C014] 14. The ultrasound system of claim 13, wherein the ultrasound probe further comprises an amplifier configured for amplifying the electrical signals.

[C015] 15. The ultrasound system of claim 14, wherein the optical conduit further comprises:

a plurality of multiplexers, each configured for coupling a corresponding one of the electro-optic modulators and a corresponding set of the transducer elements and conducting electrical signals of a selected one set of transducer elements to the corresponding one of the electro-optic modulators.

[C016] 16. The ultrasound system of claim 13, wherein the ultrasound system further comprises a plurality of demultiplexers configured for demultiplexing the optically modulated analog signals received from the electro-optic modulators.